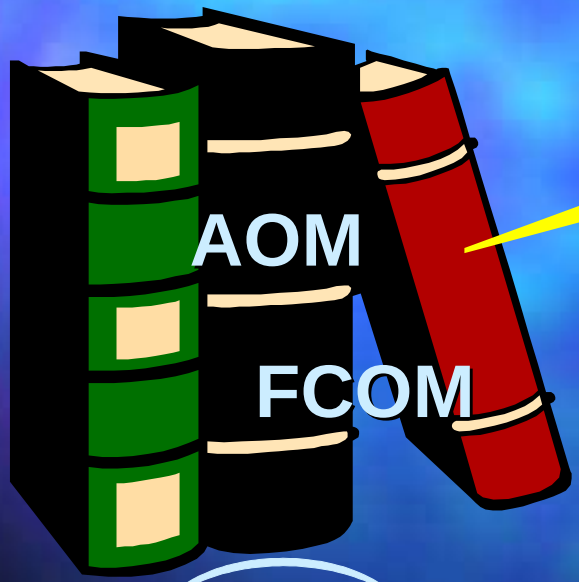
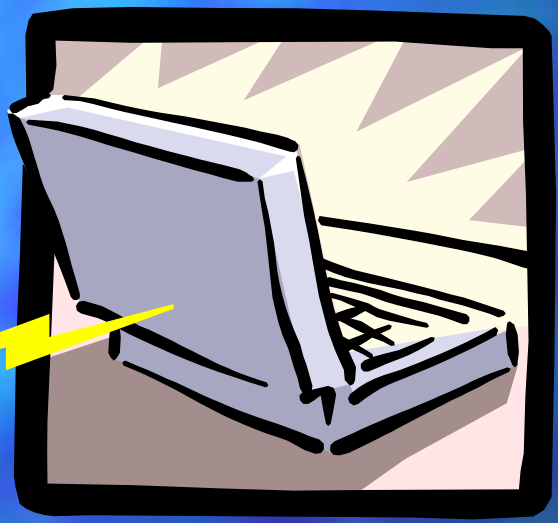
Flight Operations Information Exchange

1980's





1990's

2000& beyond

ATA **Flight Operations Working Group (FOWG)**

Flight Operations Information

Why are you here today?

See what is presently available in the area of electronic display of aviation information

See what the future possibilities are in the area of electronic manipulation of aviation information

Flight Operations Information

Why am I here today?

Flight Operations Working Group
ATA

What is presently available

What the future requirements are

Present...

- Creation...
  - Write and word process
- Management...
  - Electronic storage of files and documents
- Delivery…
  - Paper & books
  - Display of document pages

Future...

- Creation…
  - Data recovery and reusable word process
- Management...
  - Electronic data storage & linking
- Delivery…
  - Electronic smart search & display

Future Requirements

What is the biggest hurdle to overcome today for the future?

Lack of a common data standard ….

No Industry Standard of Aircraft Systems in Flight Ops

- Alphabetic order of common names
- Alphabetic order of standard names
- Chronological order of applied systems
- ATA naming standard and number reference
- And others used by individual operators...

No Industry Standard of Phases of Flight

- Advanced Qualifications Programs (AQP)
- Flight Ops quality assurance (FOQA)
- Crew Resource Management (CRM)
- Computer Base Flight Training (CBT)
- Aircraft systems
  - Flight warning systems
  - Flight management systems
- And others used by individual operators...

Display of Information (Present)

- Still no industry standard data
- Still no industry delivery standard
- Regulators show interest in dictating structure and content (JAR)
- Fluid information with constant modifications to operating information
- Display paper and books electronically
- Use of proprietary delivery and search means

	AIRBUS	BOEING	BOMBARDIER	EMBRAER
VOLUME 1	**Systems** Arranged by: ATA Spec	Limitations Normal Procedures Supp Procedures	**Systems** Arranged by: Alphabetic	General Limitations Emerg/Abnormal Normal Proc Performance Flight Planning Weight and Balance Loading Config Dev List Min Equipt List Emerg Info Emergency Evac Grnd Servicing
VOLUME 2	Loading T.O Perf Land Perform Special Ops Flight Planning	**Systems** Arranged by: Alphabetic	Limitations Checklists Normal Ops Supp Procedures Emergency Abnormals Performance Spec Ops In Flight Checks	**Systems** Arranged by Chronological Use
VOLUME 3 & 4	Limitations Abnormals Std Oper Proc Supp Technics In Flight Performance Engine Out Ops FMGS Volume			
QRH	Emergency Abnormals	ALL Non-normals ALL Performance	Warnings Cautions	Normals Section Abnormals: Emergency Cautions
FORMAT	SGML w/FrameMaker CD-ROM (html) Paper	Some SGML FrameMaker PDF Paper	Quicksilver / (Interleaf) Paper	Word, PDF Paper
PAGE	5.83 x 8.27 (A5)	5.5 x 8.5	8.5 x 11	5.5 x 8.5

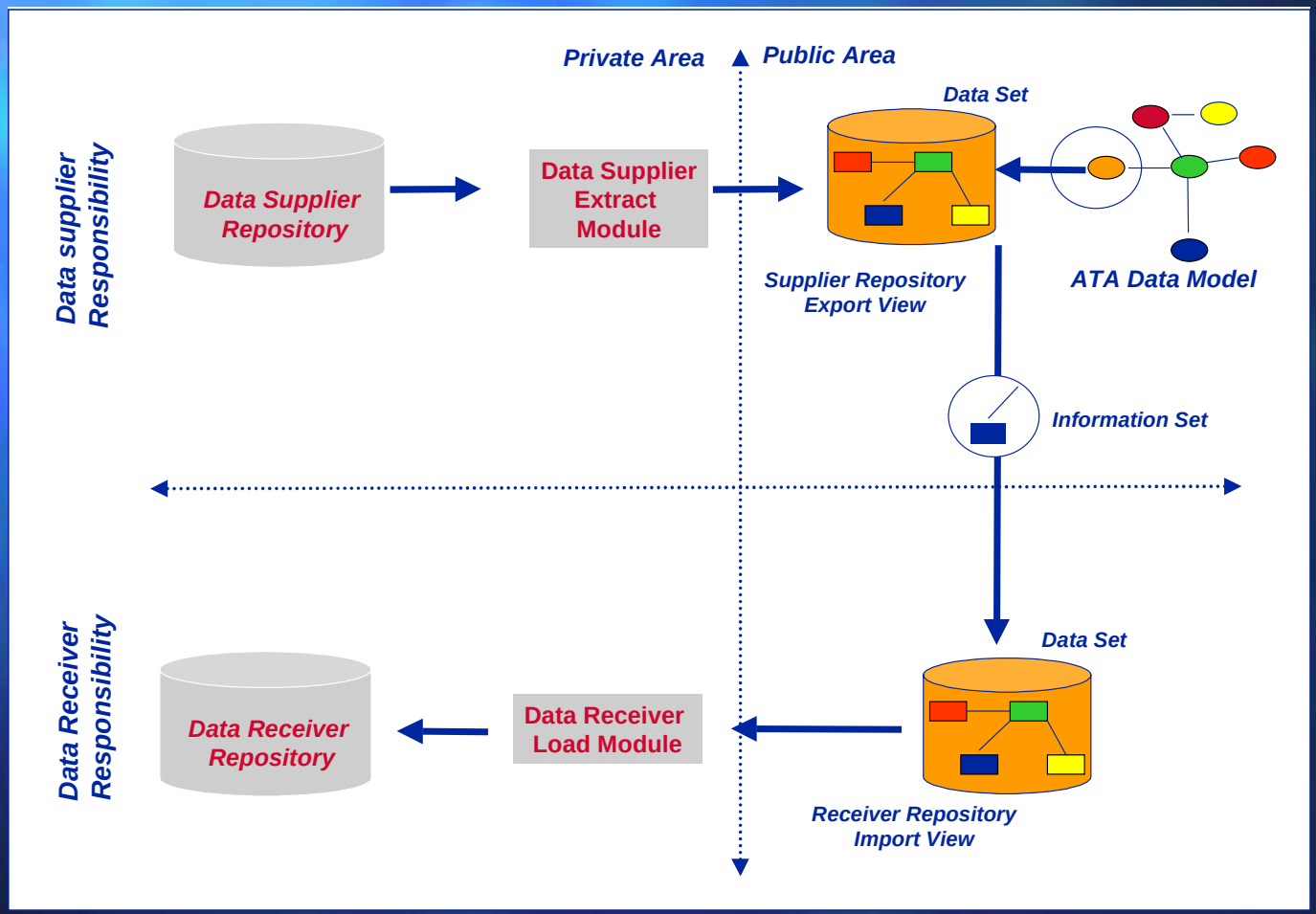
Electronic Manipulation of Data (Future)

- Establish industry data delivery standard
- Regulators achieve electronic signature approval at data level
- Data transfer protocols to meet cross-functional needs of variety of information users
- Search and retrieve linked electronic text by user Mental Model of information
- Non-proprietary common delivery protocol

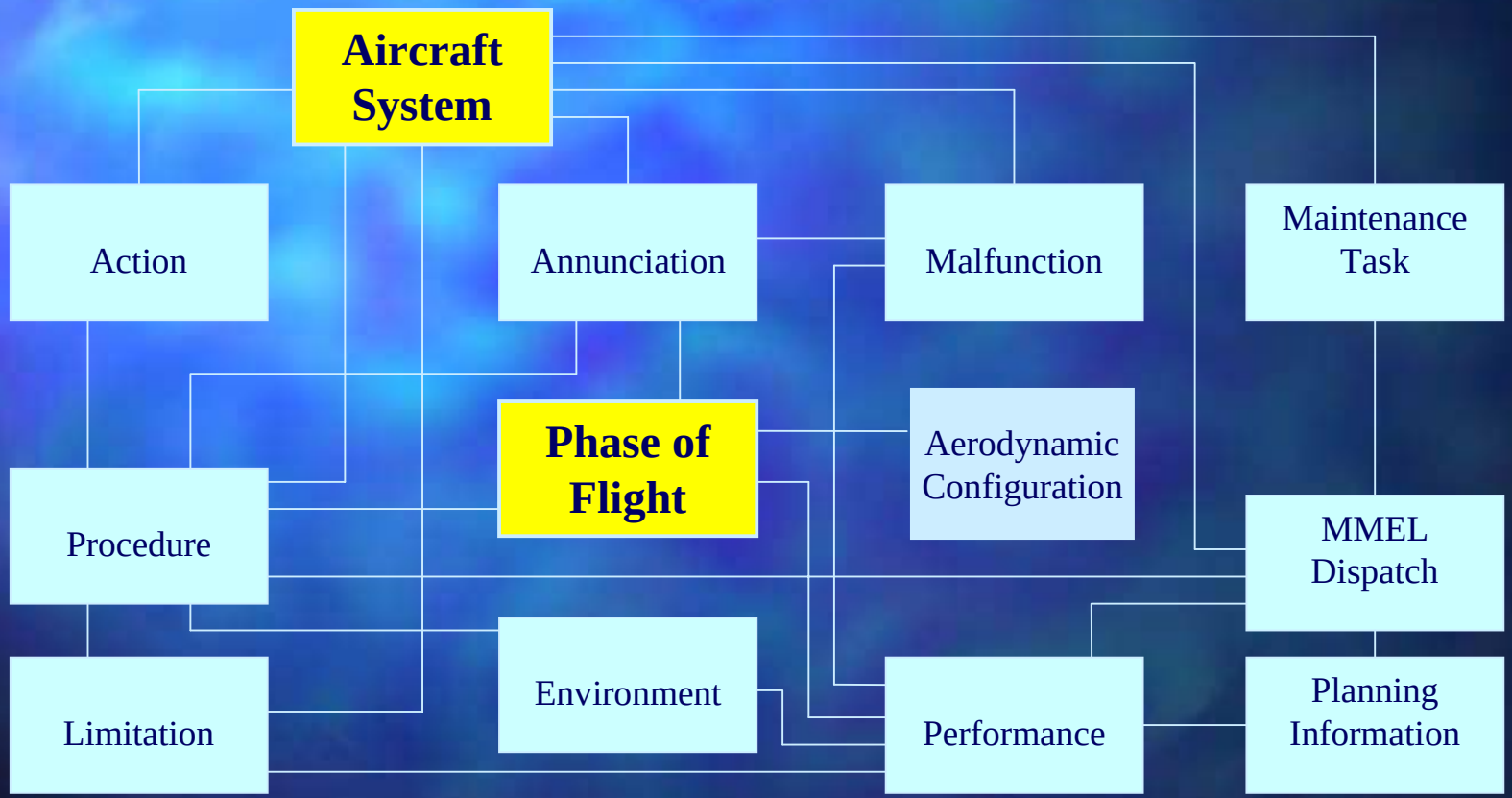
Flight Operations Working Group (FOWG)

- Addresses operators need for maintaining each operators own standard structure
- Addresses manufacturer desire to limit numerous delivery standards
- Addresses the need for future electronic delivery of linked textual information
- Addresses the need for Common Information for developing display software and hardware

What is the Transfer Model?



Simplified FOWG DATA Model



Structure for Aircraft Systems Info…ATA Systems

Standard in Maintenance

Illustrated Parts Catalogue
Trouble Shooting Manual
Aircraft Maintenance Manual
Master Minimum Equipment List

- common data manipulation between fleets
- common use of software
- common use of hardware interface
- widely used and accepted standard

Standard for Flight Operations data interchange!

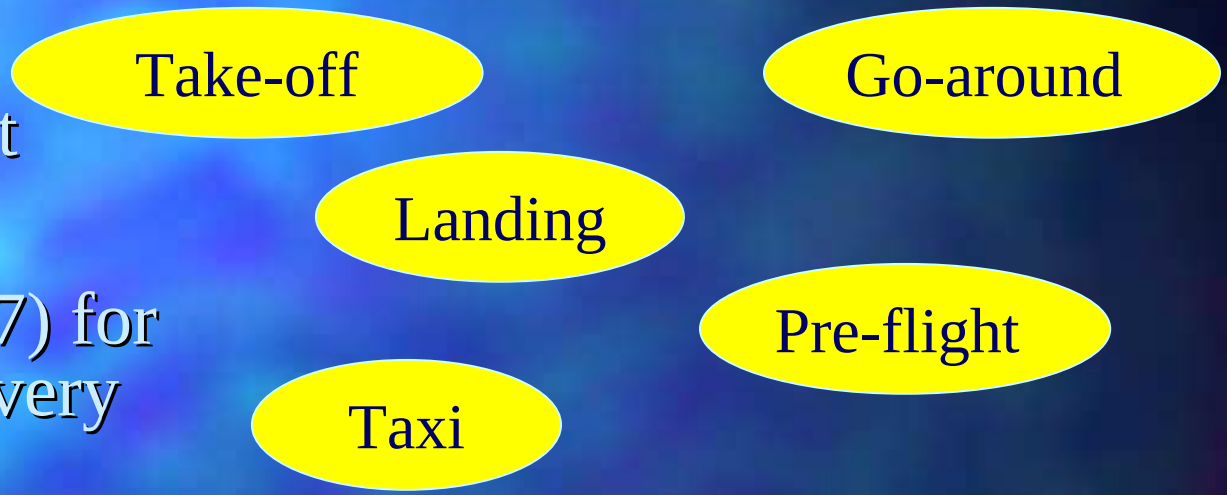
ATA Systems…
@Two Digit Level Only

20 General
21 Air Conditioning & Pressurization
22 Autoflight
23 Communications
24 Electrical
25 Equipment
26 Fire Protection
27 Flight Controls
28 Fuel
29 Hydraulics
30 Ice and Rain Protection
31 Indicating & Recording
32 Landing Gear
33 Lights
34 Navigation
35 Oxygen
36 Pneumatics
38 Water & Waste
45 On Board Maintenance
49 Auxiliary Power
52 Doors
56 Windows
70 Power Plant

Structure for Flight Ops Info…ATA Phase of Flight

Terminology as it exists…but

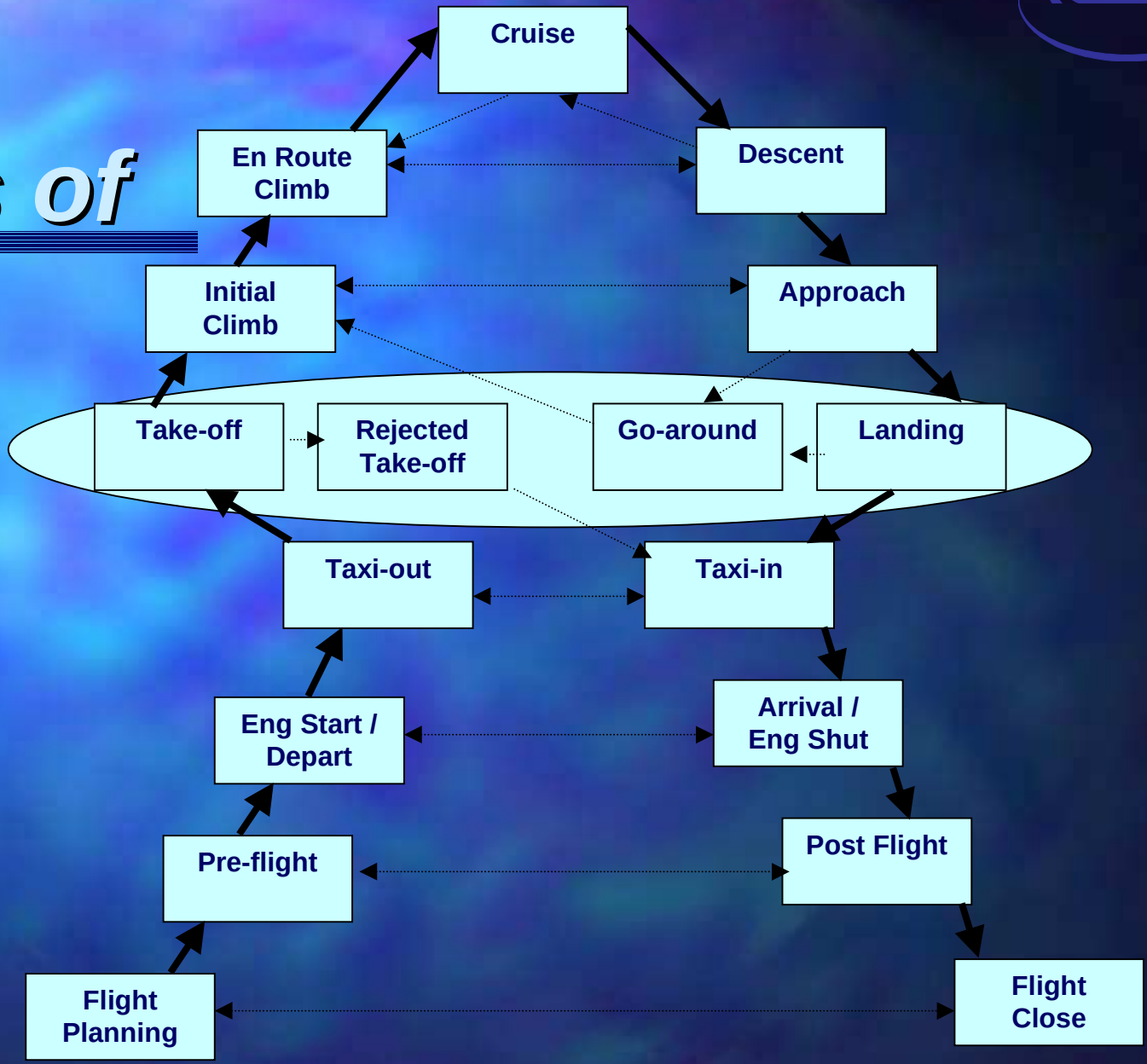
more granular (17) for information recovery



Common terms formalized and defined for standard within Flight Operations

(Not engineering terminology)

ATA Phases of Flight



ATA Phases of Flight… @Two Digit Level Only

F01 Flight Planning
F02 Pre-flight
F03 Engine Start / Depart
F04 Taxi-out
F05 Take-off
F06 Rejected Take-off
F07 Initial Climb
F08 En Route Climb
F09 Cruise
F10 Descent
F11 Approach
F12 Go-around
F13 Landing
F14 Taxi-in
F15 Arrival / Engine Shutdown
F16 Post Flight
F17 Flight Close

Two Linked Basic Entities

ATA systems
@Two Digit Level

20 General
21 Air Conditioning & Pressurization
22 Autoflight
23 Communications
24 Electrical
25 Equipment
26 Fire Protection
27 Flight Controls
28 Fuel
29 Hydraulics
30 Ice and Rain Protection
31 Indicating & Recording
32 Landing Gear
33 Lights
34 Navigation
35 Oxygen
…Etc.

ATA phases of flight
@ Two digit level

F01 Flight Planning
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F16 Post Flight
F17 Flight Close

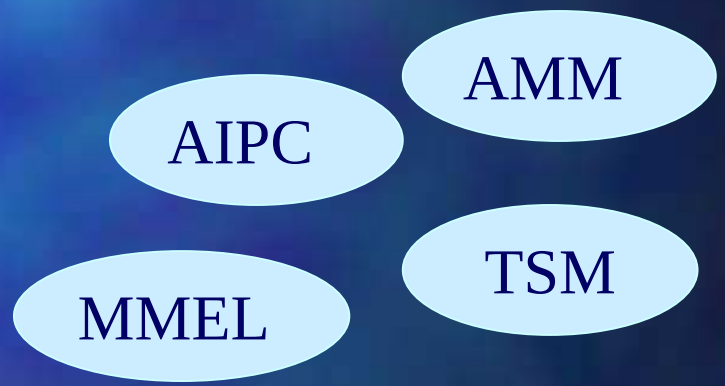
Industry Wide User Mental Model for Information Recovery

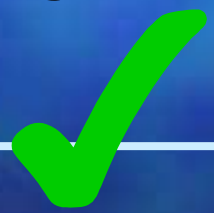
User Interface for Aircraft Maintenance and Engineering fields:

Standard in Maintenance:

Illustrated Parts Catalogue
Trouble Shooting Manual
Aircraft Maintenance Manual
Master Minimum Equipment List

ATA Systems





Current

Industry Wide User Mental Model for Information Recovery

User Interface for Flight Operations fields:

Standard in Flight Operations: ATA Systems & ATA Phase of Flight

- Limitations
- System Description
- Abnormals
- Performance
- Procedures

Not yet!

(FOWG) Mission Statement

"To develop a specification for the cost effective and efficient interchange of digital data between Information Providers and Information Users for Flight Operations"

Resolved From ATA Paris 2000 Meeting

- Not to waste time on short term solutions
- Long term solution of information/data delivery standard is the proper course
- Approximate 4 year term to get it right
- SGML may be the basis but not the long term solution … XML compliance?

Reason for an ATA Supported Spec

- Common non-proprietary data exchange standard for flight ops information manufacturer to operator and industry
- Sharing common exchange parameters re: modification status of individual aircraft with maintenance data (Generic Resources)
- Sharing common exchange parameters re: revision information (Generic Resources)

Industry Wide Links to Aeronautical Information Areas

- Re-usable data components
- Web based technologies
- Common User Interface (User Mental Model)

FOR

- Operational data
- Training data
- Safety and audit data

Standardized Electronic Data...
Ensures Cross-Functional
Common
Information!

Continued flight safety (Mental Model)

Common User Interface standard

Flight Operations becomes industry Assurance

Crew Resource Management

Crew training CBT

Systems Reference

Industry Promotion of Flight Operations Working Group

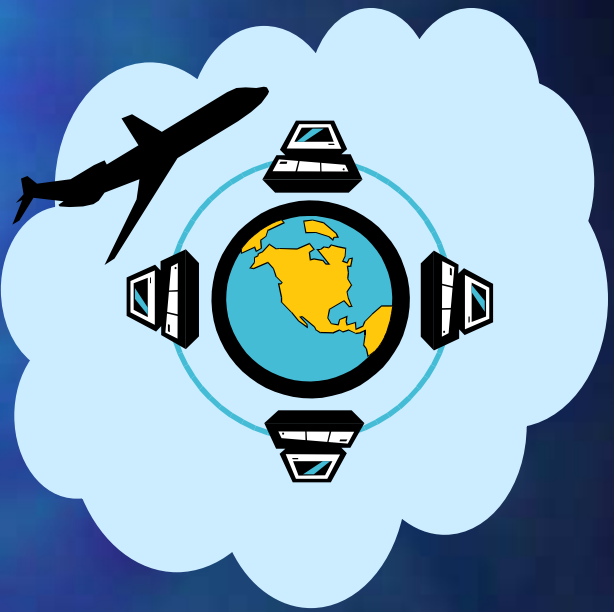
- ✔ HCI in Aeronautics publishes Phase of Flight (POF) paper (Sept 2000)
- ✔ AICC Airline Industry CBT Committee Interest in POF and Systems (Jan 2001)
- ✔ NASA/FAA Document Workshop Recognition of POF and Systems (Feb 2001)
- ✔ Correspondence w/ AQP & FOQA principles

Industry Promotion of Flight Operations Working Group

- ✔ FOWG has written “In Development Spec” for publication on this year’s ATA CD-ROM *i*SPEC 2200 using Phase of Flight Model (Dec 2000)

Future of Flight Operational Data

Flight
Operations
Working
Group



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